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# Low-velocity impact response of E-glass reinforced Thermoset and Thermoplastic based sandwich composites

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## Abstract

This paper presents an experimental investigation on impact response of sandwich composite panels with thermoplastic and thermoset face-sheet. E-glass reinforced epoxy (thermoset) and polypropylene (thermoplastic) have been used to produce polymer composite face-sheets. PVC foam was used as a core material. Several low velocity impact tests were performed under various impact energies. Besides to the individual impact behavior of the thermoset and thermoplastic sandwich composites, the impact response of sandwich composites having hybrid sequences was also investigated. Along with images of damaged samples, variations of the impact characteristics such as absorbed energy, maximum contact force and maximum deflection of the samples are provided. Most particularly this study showed that sandwich composites must have the harmony between core and the face sheet material. The deformation required for core densification must be able to compensate by the face sheet material.

**Keywords:** *Thermoplastic, thermoset, sandwich composite, impact behavior.*

## 1. Introduction

Both thermoset and thermoplastic composites have several advantages and disadvantages in terms of processing and their mechanical performance in structural applications. For example, processing of thermoset composites is much easier because the initial resin system is in the liquid state whereas the process of thermoplastic composites requires application of

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